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IS 15946 (2012): Materials for Equipment used in Gas Welding, Cutting and Allied Processes [MTD 11: Welding General]

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गैस वेल्डिंग, कटिंग एवं संबद्ध प्रक्रियाओं में प्रयुक्त उपकरणों की सामग्रियाँ

Indian Standard

MATERIALS FOR EQUIPMENT USED IN GAS WELDING, CUTTING AND ALLIED PROCESSES

ICS 77.160

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

April 2012 **Price Group 1**

Welding General Sectional Committee, MTD 11

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 9539 : 1988 ‘Materials for equipment used in gas welding, cutting and allied processes’ issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Welding General Sectional Committee and approval of the Metallurgical Engineering Division Council.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain terminology and conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appear to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is listed below along with its degree of equivalence for the edition indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 554 : 1976 Standard atmospheres for conditioning and/or testing — Specifications	IS 196 : 1966 Atmospheric conditions for testing (*revised*)	Technically Equivalent

The technical committee has reviewed the provisions of the following International Standards referred in this adopted standard and has decided that they are acceptable for use in conjunction with this standard:

International Standard	*Title*
ISO 1817 : 1985	Rubber, vulcanized — Determination of the effect of liquids
ISO 3821 : 1977	Welding — Flexible hoses for gas welding and allied processes

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding of numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

MATERIALS FOR EQUIPMENT USED IN GAS WELDING, CUTTING AND ALLIED PROCESSES

1 Scope

This International Standard specifies the general and special requirements on materials used for the construction of equipment used in gas welding, cutting and allied processes. It does not deal with materials used for the construction of welding hoses which are specified in ISO 3821 : 1977, *Welding — Flexible hoses for gas welding and allied processes.*

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 554 : 1976, *Standard atmospheres for conditioning and/or testing — Specifications.*

ISO 1817 : 1985, *Rubber, vulcanized — Determination of the effect of liquids.*

3 General requirements

Materials liable to come into contact with the process gases shall be adequately resistant to the chemical, mechanical and thermal action of these gases under all operating conditions.

Where dissimilar materials are in direct contact, steps shall be taken to prevent corrosion.

3.1 Resistance to temperature

The properties of the materials shall be such that the function for which they are intended can be performed correctly within the temperature range from -20 °C to $+60$ °C.

4 Specific requirements

4.1 Metallic materials

4.1.1 For use with acetylene and gases with similar chemical properties

The copper content of materials liable to come into contact with such gases shall not exceed 70 % (m/m); nozzles and necks of blowpipes are an exception to this requirement.

Metal flame-arresting elements (including sintered metal elements) shall be manufactured from copper-free materials.

Where brazing alloys containing silver and copper are used, the silver content shall not exceed 46 % (m/m) and the copper content shall not exceed 37 % (m/m). The brazing connection shall be designed and completed in such a way that, as far as practicable, the area where acetylene is liable to come into contact with the brazing alloy will be small and all residues of flux will be removed.

4.1.2 For use with oxygen

All components in contact with oxygen shall be free of oil and grease. Springs and other moving parts liable to come into contact with oxygen shall be made of materials which resist oxidation and they shall not be coated.

4.2 Non-metallic materials

4.2.1 Resistance to solvents

Non-metallic materials (e.g. those used for seals and lubricants) liable to come into contact with acetylene shall be adequately resistant to the solvents acetone and dimethylformamide (DMF).

For the purposes of this International Standard, the term adequate resistance (to solvents) will be taken to mean that the material shall fulfil the following conditions.

After the material has been stored

a) 168 h ± 2 h (i.e. 7 days) in an atmosphere saturated with solvent vapour at 23 °C ± 2 °C,

b) a subsequent period in air for 70 h ± 2 h at 40 °C ± 2 °C, and

c) 24 h ± 2 h at standard atmosphere 23/50 as specified in ISO 554,

the change in mass (resistance to swelling) shall not exceed 15 % and the change in hardness shall not exceed ±15 IRHD.

These tests shall be carried out in accordance with ISO 1817.

4.2.2 Resistance to *n*-pentane

Non-metallic materials (e.g. those used for seals and lubricants) liable to come into contact with propane, butane and methylacetylene-propadiene mixtures shall be adequately resistant to *n*-pentane.

For the purposes of this International Standard, the term adequate resistance (to *n*-pentane) will be taken to mean that the material shall fulfil the following conditions.

After the material has been stored for

a) 168 h ± 2 h (i.e. 7 days) in liquid *n*-pentane at 23 °C ± 2 °C,

b) a subsequent period in air for 70 h ± 2 h at 40 °C ± 2 °C, and

c) 24 h ± 2 h at standard atmosphere 23/50 as specified in ISO 554,

the change in mass (resistance to swelling) shall not exceed 15 % and the change in hardness shall not exceed ±15 IRHD.

These tests shall be carried out in accordance with ISO 1817.

4.2.3 Resistance to oxygen

All components in contact with oxygen shall be free from substances that may react violently with oxygen under normal operating conditions, e.g. hydrocarbon-based solvents, oils and greases.

Only lubricants suitable for use in oxygen at maximum operating pressure and temperature shall be used.

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard alongwith amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.org.in

Regional Offices:			*Telephones*
Central	:	Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	2323 7617 2323 3841
Eastern	:	1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi KOLKATA 700054	2337 8499, 2337 8561 2337 8626, 2337 9120
Northern	:	SCO 335-336, Sector 34-A, CHANDIGARH 160022	260 3843 260 9285
Southern	:	C.I.T. Campus, IV Cross Road, CHENNAI 600113	2254 1216, 2254 1442 2254 2519, 2254 2315
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